Name: Date:

Polynomial Factoring solution (version 47)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 10x + 52 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(1)(52)}}{2(1)}$$

$$x = \frac{-(-10) \pm \sqrt{100 - 208}}{2(1)}$$

$$x = \frac{10 \pm \sqrt{-108}}{2}$$

$$x = \frac{10 \pm \sqrt{-36 \cdot 3}}{2}$$

$$x = \frac{10 \pm 6\sqrt{3}\, i}{2}$$

$$x = 5 \pm 3\sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-8 - 5i$ and $2 - 3i$ in standard form ($a + bi$).**

Solution

$$(-8 - 5i) \cdot (2 - 3i)$$
$$-16 + 24i - 10i + 15i^2$$
$$-16 + 24i - 10i - 15$$
$$-16 - 15 + 24i - 10i$$
$$-31 + 14i$$

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3. **Write function $f(x) = x^3 - 7x^2 + 4x + 12$ in factored form. I'll give you a hint: one factor is $(x + 1)$.**

Solution

	1	-7	4	12
-1		-1	8	-12
	1	-8	12	0

$$f(x) = (x+1)(x^2 - 8x + 12)$$

$$f(x) = (x+1)(x-6)(x-2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+4) \cdot (x+1)^2 \cdot (x-3) \cdot (x-7)^2$$

Sketch a graph of polynomial $y = p(x)$.